

# Electric Vehicles

An E-vehicle or Electric Vehicle is one that needs an electric motor to generate power and function instead of an internal-combustion engine that generates power by burning a mix of gases and fuel.

- Electric Vehicles have a battery that can be charged by an electric supply. This electric energy is used to run the motor
- There is a hybrid electric vehicle as well, which means a combination of an electric motor and combustion engine.
- Electric Vehicles (EVs) include electric aircraft, road and rail vehicles, electric spacecraft, and underwater vessels.
- The discussion of E-vehicle has been going around for decades. However, it has drawn a significant amount of attention in the past few years amid climate change and rising carbon footprint.

## Types of Electric Vehicles

Electric Vehicles can be categorized into four types. These groups differentiate based on the source of power they use. For instance, some EVs only run on electricity, while some EVs use a combination of petroleum or diesel and electricity.

- Plug-in electric - Such vehicles purely run on electricity, and it is powered when it is plugged in to charge. They don't produce emissions like petrol or diesel.
- Plug-in hybrid - Their primary source of power is electricity, but these vehicles also have a fuel engine. These cars produce emissions only when they run on fuel engines but not when they run on electricity.
- Hybrid-electric - These vehicles primarily run on petrol or diesel, but they're also fitted with an electric battery. One can charge the battery through regenerative braking. It comes with a button that lets you switch from using a fuel engine to using an electric battery (EV mode.)
- Fuel Cell Electric Vehicles (FCEVs)- these vehicles use a highly efficient electrochemical process to convert hydrogen into electricity, and it powers the electric motor.

## Advantages of Electric Vehicles [EV]

Some perks of using Electric Vehicles are -

- Save your money as you won't be needed to buy petrol or gas in the future.
- You can quickly charge your vehicle using a mundane household socket.
- They are 100% sustainable and eco-friendly. Thus, you'll be contributing towards saving the environment.
- Electric Vehicles don't need regular maintenance.

- Electric Vehicles are safer to drive than gas-powered vehicles as they have a lower centre of gravity, making them more stable in case of collision.
- Electric Vehicles are cheaper to buy, and the government usually offers incentives to the manufacturers and customers who produce or use Electric Vehicles.
- Electric Vehicles have reduced noise pollution as their batteries are much quieter.
- They are much easier to drive. There is no need to change the clutch or gears continuously.

## Challenges Related to the EV industry in India

Electric Vehicles have not penetrated the Indian market, which is almost the lowest in the world. Here are some major challenges related to the EV industry in India.

- India is having challenges related to the technological production of electronics such as the battery, semiconductors, etc.
- Government's uncertainty in policymaking is another challenge for investors in this industry. It is a capital-intensive sector and will make a profit in the near future.
- The local production is just 35% of the total input production of Electric Vehicles.
- India does not have any reserve for lithium and cobalt, which is important for battery production and is the most important component for EVs. This is related to increasing the cost of production because of its dependency on China and Japan.
- High rate of GST and depreciation of the rupee is another challenge for the Electric Vehicles industry.
- Lack of infrastructure related to AC versus DC charging stations, grid stability, and fear anxiety related to the battery will run out soon are other hindrances.
- This industry needs skilled workers and high services.
- India lacks dedicated courses and training in this area.

## Electric Vehicles in India: Initiatives by the Government

- Government has set a target of 30% new sale of electric vehicles and two-wheelers by 2030. The government is working towards it by following the initiative and policy-

### National Electric Mobility Mission Plan (NEMMP)

- It is a road map/document for India's fuel security by promoting and faster adoption of electric vehicles in India with the initial allocation of Rs 75crore. The ambition is to have around 6 million vehicles on the road by 2020.
- This plan is for affordable and environmentally friendly transportation in the country and to achieve automotive leadership in global manufacturing.

## **Faster Adoption and Manufacturing of (hybrid and) electric vehicles (FAME)**

- The scheme was announced by the government in 2015 with the objective of market creation and developing a manufacturing ecosystem with sustainable growth.
- It is formulated by the department of Heavy Industry having 4 key areas- technology creation, demand creation, pilot projects, and infrastructure related to charging.

## **Faster Adoption and Manufacturing of (hybrid and) electric vehicles (FAME) II**

- Based on the result and experience of phase I of the scheme, phase II was launched with an allocation of Rs 10000 Crore over three years, recently approved by the cabinet.
- This scheme vision a holistic approach to the EV industry, including infrastructure for charging, manufacturing of batteries, market creation, public demand, and push for EVs in public transport.
- It also offers incentives to the manufacturer of electric vehicles and their components.
- It enables the creation of charging infrastructure in selected cities and major highways at an interval of 25 km.

## **Future of Electric Vehicles in India**

The battery manufacturing industry in India can grow to a significant extent. It can become bigger than the total amount spent on crude oil imports. If this happens, it would be a great boost for the Indian economy.

- By strengthening the supply, ecosystem, and demand, the Electric Vehicles sector will grow in a significant way.
- Many companies have already started manufacturing Electric Vehicles in India. The demand for electric scooters is increasing rapidly.
- Research work is going on to reduce the dependence on Lithium-Ion batteries in China.
- However, the lack of enough charging stations in India is one of the major concerns for the EV industry.
- There are many challenges but the future of electric vehicles in India looks promising and bright.

## **Electric Vehicle Policy (EV) 2020**

Electric Vehicle Policy 2020 has been announced by the Delhi Government where it put emphasis on the replacement of two-wheelers, shared vehicles, public transport, and private four-wheelers with Electric Vehicles. Some of the Features of EV Policy 2020 are given below:

- As per Electric Vehicle Policy, the focus is given on e-mobility, which includes e-buses and e-autos.
- The government has decided to give low-interest loans so that people can purchase Electric Vehicles easily.
- The main goal of the E-Vehicle Policy in India is to reduce pollution and curb health issues in Delhi.
- State EV Fund will be introduced for the expenditure of EV Policy.

